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Adequate Yearly Progress (AYP): Growth Models Under the No Child Left Behind Act

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Summary

A key concept embodied in the accountability provisions of the Elementary and Secondary Education Act (ESEA), as amended by the No Child Left Behind Act of 2001 (NCLB, P.L. 107-110), is that of adequate yearly progress (AYP). In order to be eligible for grants under ESEA Title I, Part A—Education for Disadvantaged Pupils—states must implement AYP policies applicable to all public schools and local educational agencies (LEAs), based primarily on the scores of pupils on state assessments. Schools or LEAs that fail to meet AYP standards for two or more consecutive years face a variety of consequences.

The primary model of AYP under the NCLB is a group status model. Such models set threshold levels of performance, expressed as a percentage of pupils scoring at a proficient or higher level on state assessments of reading and mathematics, that must be met by all pupils as a group, as well as pupils in designated demographic subgroups, in order for a public school or LEA to make AYP. Current law also includes a secondary model of AYP, a "safe harbor" provision, under which a school or LEA may make AYP if, among pupil groups who did not meet the primary AYP standard, the percentage of pupils who are *not* at the proficient or higher level declines by at least 10%.

Substantial interest has been expressed in the use of individual/cohort growth models to meet the AYP requirements of the NCLB. Such AYP models are not consistent with certain statutory provisions of the NCLB, as those were originally interpreted by the U.S. Department of Education (ED). However, under a pilot program, ED has approved applications from 15 states for waivers to use growth models to make AYP determinations, and regulations adopted in late 2008 allow an unlimited number of states to apply for this option. Many proponents of growth models of AYP see them as being more fair and accurate than the models generally employed to meet NCLB requirements, primarily because they recognize the fact that different schools and pupils have different starting points in their achievement levels, and recognize progress being made at all levels.

Growth models of AYP have the disadvantage of implicitly setting lower initial thresholds or expectations for some pupils. Although any growth model consistent with the NCLB would need to incorporate the act's ultimate goal of all pupils at a proficient or higher level of achievement by 2013-2014, such models used currently in state (non-NCLB) accountability plans do not include such goals and might allow disadvantaged schools and pupils to remain at relatively low levels of achievement for significant periods of time. Growth models of AYP may be quite complicated and may address the accountability purposes of the NCLB less directly and clearly than the currently statutory AYP models.

The authorization for ESEA programs expired at the end of FY2008, and the 111th Congress is expected to consider whether to amend and extend the ESEA. This report will be updated regularly to reflect major legislative developments and available information.

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A key concept embodied in the accountability provisions of the Elementary and Secondary Education Act (ESEA), as amended by the No Child Left Behind Act of 2001 (NCLB, P.L. 107-110) is that of adequate yearly progress (AYP) toward proficiency on state assessments.[1] In order to maintain eligibility for grants under ESEA Title I, Part A—Grants to Local Educational Agencies (LEAs) for the Education of Disadvantaged Pupils, the largest federal K-12 education program—states must establish and implement standards of AYP that are applicable to all public schools and LEAs in the state, as well as the state overall. These AYP standards are to be based primarily, although not solely, on the scores of all pupils as a group, as well as pupils in designated demographic subgroups, on state developed or selected assessments that are linked to state standards of curriculum content and pupil performance.[2] Schools or LEAs that fail to meet AYP standards for two or more consecutive years face a variety of consequences and, ultimately, corrective actions.[3] The authorization for ESEA programs expired at the end of FY2008, and the 111th Congress is expected to consider whether to amend and extend the ESEA. This report will be updated regularly to reflect major legislative developments and available information.

Substantial interest has been expressed in the use of growth models to meet the AYP requirements of the NCLB. Such AYP models are not consistent with certain statutory provisions of the NCLB, as they were originally interpreted by the U.S. Department of Education (ED). In November 2005, the Secretary of Education announced a growth model pilot program under which up to ten states would be allowed to use growth models to make AYP determinations for the 2005-2006 school year. In December 2007, the Secretary lifted the cap on the number of states that could participate in the growth model pilot, and regulations published in October 2008 incorporate this expanded policy. Thus far, the applications of 15 states—Alaska, Arkansas, Arizona, Colorado, Delaware, Florida, Iowa, Michigan, Minnesota, Missouri, North Carolina, Ohio, Pennsylvania, Tennessee, and Texas—have been approved to participate in the pilot program. This report discusses growth and other models for AYP determinations, and analyzes issues related to the use of growth models to meet the AYP requirements of the NCLB.

The Range of Possible Models for Measuring AYP for Schools and LEAs

While AYP definitions or standards may vary in a multitude of respects, their basic structure generally falls into one of three general categories. The No Child Left Behind Act statute, as implemented by ED currently, places primary emphasis on one of these models, while incorporating a second model as an explicitly authorized alternative. In recent years, critics of current policy have increasingly focused their attention on a third model of AYP, which is the primary topic of this report.

The three basic structural forms for AYP of schools or LEAs are the *group status*, *successive group improvement*, and *individual/cohort growth* models. In the context of these terms, "group"

[1] For general information on all aspects of the AYP concept in general, the No Child Left Behind Act provisions for AYP, and related issues, see CRS Report RL32495, *Adequate Yearly Progress (AYP): Implementation of the No Child Left Behind Act*, by Wayne C. Riddle.

[2] For more information on the pupil assessment requirements of the No Child Left Behind Act, see CRS Report RL31407, *Educational Testing: Implementation of ESEA Title I-A Requirements Under the No Child Left Behind Act*, by Wayne C. Riddle.

[3] For a discussion of these consequences and corrective actions, see CRS Report RL31487, *Education for the Disadvantaged: Overview of ESEA Title I-A Amendments Under the No Child Left Behind Act*, by Wayne C. Riddle; and CRS Report RL33506, *School Choice Under the ESEA: Programs and Requirements*, by David P. Smole.

(or "subgroup," in the case of detailed demographic categories) refers to a collection of pupils that is identified by their grade level and usually other demographic characteristics (e.g., race, ethnicity, or economic disadvantage) as of a point in time, such as all Hispanic 3rd grade pupils enrolled in a school or LEA in a particular year. The actual pupils in a "group" may change substantially, or even completely, from one year to the next. In contrast, a "cohort" refers to a collection of pupils in which the *same* pupils are followed from year-to-year, such as the Hispanic pupils who entered 3rd grade in a school, LEA or state in fall 2002, and have been followed as a cohort since that time.

The key characteristic of the *group status* model is a fixed "annual measurable objective" (AMO), or required threshold level of achievement, that is *the same* for all pupil groups, schools, and LEAs statewide in a given subject and grade level. Under this model, performance at a point in time is compared to a benchmark at that time, with no direct consideration of changes over a previous period.

The key characteristic of the *successive group improvement* model is a focus on the *rate of change* in achievement in a subject area from one year to the next among *groups* of pupils in a grade level at a school or LEA (e.g., the percentage of this year's 5th grade pupils in a school who are at a proficient or higher level in mathematics compared to the percentage of last year's 5th grade pupils who were at a proficient or higher level of achievement).

Finally, the key characteristic of the *individual/cohort growth* model is a focus on the *rate of change* over time in the level of achievement among *cohorts* of the same pupils. Such models may compare current performance of specific pupils or cohorts to past performance, or may project future performance of pupils/cohorts based on past changes in their performance level. Growth models are *longitudinal*, based upon the tracking of the same pupils as they progress through their K-12 education careers. While the progress of pupils is tracked individually, results are typically aggregated when used for accountability purposes. Aggregation may be by demographic group, by school or LEA, or other relevant characteristics. In general, growth models would give credit for meeting steps along the way to proficiency in ways that a status model typically does not.[4]

To help illustrate the basic differences among these three AYP models, simplified examples of basic aspects of each are described below. The reader should keep in mind many other variations of these model types are possible.

- A *group status* model, such as the current primary model of AYP under the NCLB (described further below), establishes a series of threshold levels or AMOs, which are percentages of pupils scoring at a proficient or higher level of achievement on state standards-based assessments of reading and mathematics. These AMOs have a starting point and a series of increases toward (in the case of the NCLB) an ultimate goal of 100% of pupils at a proficient or higher level of achievement, covering a multi-year period (for the NCLB, the period of 2001-2002 through 2013-2014). These AMOs are specific to each grade level and subject (reading or mathematics) at which state assessments are administered. A key feature of the AMOs in this model is that they are the same for all pupil groups—the "all pupil" group as well as each of the demographic subgroups specified under the NCLB (pupils with disabilities, pupils from low-income families, pupils with limited English proficiency, etc.). This model focuses solely

[4] There is a variant of the group status model, sometimes called an "index model," under which partial credit would be attributed to performance improvements below the proficient level—e.g., from below basic to basic.

on current year performance of the pupils currently enrolled in each school/LEA for every grade level at which assessments are administered.[5] Comparisons to previous year performance play no role in AYP determinations.

- An example of a simplified *successive group improvement* model is the secondary ("safe harbor") model authorized under the NCLB. Under this model, as embodied in the NCLB, the basic structure of the AYP system is the same as described above, but the primary focus shifts to the change from the previous year for each group assessed. If any specified demographic group fails to meet the primary group status AYP criterion described above, the school or LEA is still deemed to meet AYP standards if the percentage of pupils scoring *below* the proficient level declines by 10% in comparison to the previous year for pupils in that grade level and demographic group. Thus, the primary focus shifts to the *change* in achievement from the previous year, comparing (for example) this year's pupils from low-income families in the particular school/LEA/grade level to last year's pupils from low-income families enrolled in that school/LEA/grade level (i.e., the pupils are in the same demographic category, but are not necessarily the same pupils).[6]
- An *individual/cohort growth* model begins by tracking the performance of individual pupils over multiple (at least two) years. The performance of pupils in the same grade level who share relevant demographic characteristics within a school, LEA, or the state overall may be combined into a cohort. The *change* in scores for this cohort is compared to a standard of *expected growth*. The expected growth may be either "data-driven" (e.g., the statewide average rate of achievement growth for all pupils, or the predicted rate of growth statewide for pupils with similar demographic characteristics), or "policy-driven" (a multi-year growth path sufficient to meet an ultimate goal, such as the NCLB requirement for all pupils to reach a proficient or higher level of achievement by 2013-2014). A school or LEA is deemed to meet AYP requirements if the achievement growth of each relevant cohort of pupils meets the expected level of growth. The path of expected growth, as well as the starting points for the growth path, will likely differ for each relevant demographic group of pupils.

Some growth models, often called *value-added models*, also incorporate a variety of statistical controls, adjustments to account for pupil demographic characteristics or past achievement, to sharpen the focus on estimating the impact of specific teachers, schools, or LEAs on pupil achievement and to measure pupil growth against *predicted* growth for pupils with similar characteristics, but these are not essential elements of all growth models. Proponents argue that such models, with their controls for background characteristics and past learning, maximize the focus on factors that are under the control of teachers and other school staff. The Tennessee Value-Added Assessment System (TVAAS) is one specific form of growth model that uses pupil background characteristics, previous performance, and other data as statistical controls in order to

[5] Scores may be combined for pupils in all assessed grade levels in a school.

[6] One state, Massachusetts, has injected a partial growth element into its safe harbor provision. In that state, a school or LEA that fails to meet the standard AYP requirements still makes AYP if the number of pupils in relevant groups and subjects scoring below the proficient level declines by 10% or more from the previous year *or* declines sufficiently to put them on track toward proficiency by the end of the 2013-2014 school year.

focus on estimating the specific effects of particular schools, districts, teachers or programs on pupil achievement.[7]

The AYP Models Explicitly Authorized by the NCLB

The primary model of AYP under the NCLB currently is a group status model. As noted in the example above, group status models set as their AMOs threshold levels of performance, expressed specifically in terms of the percentage of pupils scoring at a proficient or higher (advanced) level on state assessments of reading and mathematics. These AMOs must be met by any school or LEA, both overall and with respect to all relevant pupil subgroups, in order to make AYP, whatever the school's or LEA's "starting point" (for the multi-year period covered by the accountability policy) or performance in the previous year. This AMO "uniform bar" is applicable to all pupil subgroups of sufficient size to be considered in AYP determinations. The threshold levels of achievement are to be set separately for reading and math, and may be set separately for each level of K-12 education (elementary, middle, and high schools). For example, it might be required that 45% or more of the pupils in any of a state's public elementary schools score at the proficient or higher level of achievement in reading in order for a school to make AYP.[8]

The initial minimum starting point for the "uniform bar" is to be the greater of (a) the percentage of pupils at the proficient or advanced level of achievement for the lowest-achieving pupil subgroup in the base year (2001-2002), or (b) the percentage of pupils at the proficient or advanced level of achievement for the lowest-performing quintile (5^{th})[9] of schools statewide in the base year.[10] The "uniform bar" must generally be raised at least once every three years, although in the initial period it must be increased after no more than two years. Such group status models attempt to emphasize the importance of meeting certain minimum levels of achievement for all pupil groups, schools, and LEAs, and arguably apply consistent expectations to all pupil groups.

The secondary model of AYP under the NCLB currently is the "safe harbor" provision, an example of a successive group improvement model.[11] This is an alternative provision under which schools or LEAs that fail to meet the usual requirements may still be deemed to have made AYP if they meet certain other conditions. A school where aggregate achievement is below the level required under the group status model described above would still be deemed to have made

[7] See, for example, *Issues in the Design of Accountability Systems*, by Robert L. Linn, CSE Technical Report 650, National Center for Research on Evaluation, Standards, and Student Testing, April 2005.

[8] It has occasionally been said that the AYP systems approved by ED for a few states before initiation of the growth model pilot announced in November 2005 incorporate "growth" elements. However, such claims appear to be based primarily on the inclusion in the AYP systems of "pupil achievement indexes" (i.e., the "index models" referred to in the first footnote under the section "The Range of Possible Models for Measuring AYP for Schools and LEAs," above) that give partial credit for achievement gains below the proficient level, comparing this year's pupil groups with last year's. They do not meet the definition of growth model as used in this report.

[9] This is determined by ranking all public schools (of the relevant grade level) statewide according to their percentage of pupils at the proficient or higher level of achievement (based on all pupils in each school), and setting the threshold at the point where one-fifth of the schools (weighted by enrollment) have been counted, starting with the schools at the lowest level of achievement.

[10] Under program regulations [34 C.F.R. § 200.16(c)(2)], the starting point may vary by grade span (e.g., elementary, middle, etc.) and subject.

[11] This secondary AYP provision of NCLB is sometimes referred to as a "growth model," but it is not consistent with that term as used in this report, in part because it is based on pupil group averages, and not the longitudinal or projected performance of individual pupils or a cohort of such pupils.

AYP, through the "safe harbor" provision, if, among relevant pupil groups who did not meet the primary AYP standard, the percentage of pupils who are *not* at the proficient or higher level in the school declines by at least 10% (not 10 percentage points)[12], and those pupil groups make progress on at least one other academic indicator included in the state's AYP standards.[13] For example, if the standard AMO is 45%, and a school fails to meet AYP because of the performance of one pupil group (e.g., the mathematics scores of white pupils) and the percentage of such pupils scoring at a proficient or higher level the previous year was 30%, then the school could still make AYP if the percentage of white pupils scoring at a proficient or higher level increases to at least 37% (the 30% from the previous year plus 10% of (100%-30%), or seven percentage points).

During debates over the adoption of NCLB in 2001, much of the attention was focused on successive group improvement models of AYP, not group status or individual/cohort growth models. Both the Senate-passed version, and the primary elements of the House-passed version, of the bill (H.R. 1, 107th Congress) that became NCLB embodied successive group improvement concepts of AYP.[14] Relatively little attention was paid to individual/cohort growth models during consideration of NCLB. The group status model adopted by the conferees on H.R. 1 as the primary AYP concept under NCLB substantially resembled the pre-NCLB AYP definition used in the state of Texas.

Possible reasons why relatively little attention was devoted to individual/cohort growth models of AYP during consideration of NCLB in 2001 include the fact that they were used by few states at the time to meet accountability requirements under either state law or under federal law preceding NCLB (the Improving America's Schools Act of 1994);[15] the implicit demand for resources (both extensive, pupil-level longitudinal data systems and analytical capacity in state educational agencies); their relative complexity, compared to the status and improvement models; their assumed requirement for annual pupil assessments throughout all, or at least most, of pupils' K-12 education careers, which very few states had in place; and the difficulty (although not the impossibility) of integrating into growth models an ultimate goal of all pupils at a proficient or higher level of achievement by a specified time.

The remainder of this report will focus almost totally on individual/cohort growth models of AYP versus group status models, and little further attention will be paid to successive group improvement models of AYP. This is primarily because the "safe harbor" alternative model of AYP is already available (unlike the individual/cohort growth model alternative), and because it has reportedly been invoked relatively infrequently. Some analysts argue the "safe harbor" provision is used infrequently because it sets a very challenging standard, at least for pupil groups

[12] As noted earlier, under the accountability policy approved for use in Massachusetts, a school or LEA also meets the safe harbor requirement if the number of pupils in relevant groups and subjects scoring below the proficient level declines sufficiently to put them on track toward proficiency by the end of the 2013-2014 school year.

[13] Under NCLB, state AYP systems must include at least one indicator, other than achievement test scores. For senior high schools, the additional indicator must be the graduation rate. A typical additional indicator for elementary and middle schools is the attendance rate.

[14] The Senate-passed bill would have authorized states to use index systems with a limited growth-related element—under an index system, states could have combined different demographic groups of pupils, with greater weight applied to pupils whose level of achievement was initially furthest below the proficient level.

[15] During the immediate pre-NCLB period, a few states identified schools as failing to make AYP if they failed to meet "expected growth" in performance based on factors such as initial achievement levels and statewide average achievement trends. The "growth" models used by states in the pre-NCLB period were generally much closer in structure to the successive group improvement model, as described in this report, than to the individual/cohort growth model.

that are currently at relatively low levels of proficiency,[16] and that the required 10% reduction in pupils below the proficient level should be reduced, perhaps to 3%-4%.[17]

Growth Model Alternatives to NCLB's Statutory Models of AYP

For the sake of simplicity, in the remainder of this report we will refer to the three AYP models by the abbreviated titles of "status," "improvement," and "growth" models. In recent years, as experience with NCLB requirements for AYP has been accumulated within states, LEAs, and schools, increased attention has been devoted by some analysts and administrators to the possible use of growth models of AYP under NCLB.[18] While there are many possible variations of growth models, they would all appear to violate certain explicit statutory provisions of NCLB, at least as those were originally interpreted by ED. At the least, a growth model would involve the use of differing AMOs for different pupils, and this would violate the uniform bar approach of the primary AYP model of NCLB.[19] Growth models would also provide for different starting points or improvement paths for different pupils.

Growth Models Under the Pilot Program and 2008 Regulations

In November 2005, the Secretary of Education announced a growth model pilot program under which initially up to 10 states would be allowed to use growth models to make AYP determinations for the 2005-2006 or subsequent school years.[20] In December 2007, the Secretary lifted the cap on the number of states that could participate in the growth model pilot, and regulations published in October 2008[21] incorporate this expanded policy. The models proposed by the states must meet at least the following criteria (in addition to a variety of criteria applicable to all state AYP policies—that is, measure achievement separately in reading/language arts and mathematics):

- they must incorporate an ultimate goal of all pupils reaching a proficient or higher level of achievement by the end of the 2013-2014 school year;
- achievement gaps among pupil groups must decline in order for schools or LEAs to meet AYP standards;

[16] As noted earlier, the "safe harbor" provision requires a 10% reduction in the percentage of relevant pupils whose performance is below the proficient level. For a pupil group currently at 20%, this would require an increase in 8 percentage points (to 28%), but for a group currently at 80%, this would require an increase of only 2 percentage points (to 82%).

[17] See *Issues in the Design of Accountability Systems*, by Robert L. Linn, CSE Technical Report 650, National Center for Research on Evaluation, Standards, and Student Testing, April 2005.

[18] Readers may also wish to consult a Government Accountability Office (GAO) report published in July 2006: "No Child Left Behind Act: States Face Challenges Measuring Academic Growth That Education's Initiatives May Help Address," GAO-06-661.

[19] It is sometimes said that "index" systems incorporated into the AYP standards of three states (Massachusetts, Minnesota, and Oklahoma) constitute "growth model elements" allowed by ED under current law. However, the distinctive element of these AYP standards is the use of indexes that give partial credit for achievement gains at levels below proficient (such as moving from below basic to basic). Such provisions have been allowed by ED, at least for these three states, with the additional criteria that AYP must be calculated separately for each required subject area and subgroup, incorporate the goal of all pupils at a proficient or higher level of achievement by 2013-2014, not give extra credit for moving beyond proficient, have AMOs, and not allow a school to make AYP without increasing the number of students at the proficient level over the previous year.

[20] See http://www.ed.gov/news/pressreleases/2005/11/11182005.html.

[21] See the *Federal Register* for October 29, 2008 (pages 64435-64513).

- annual achievement goals for pupils must not be set on the basis of pupil background or school characteristics;
- annual achievement goals must be based on performance standards, not past or "typical" performance growth rates;
- the assessment system must produce comparable results from grade-to-grade and year-to-year; and
- the progress of individual students must be tracked within a state data system.

In addition, applicant states must have their annual assessments for each of grades 3-8 approved by ED, and these assessments must have been in place for at least one year previous to implementation of the growth models.

In January 2006, ED published peer review guidance for growth model pilot applications.[22] In general, this guidance elaborates upon the requirements described above, with special emphasis on the following: (a) pupil growth targets may not consider their "race/ethnicity, socioeconomic status, school AYP status, or any other non-academic" factor; (b) growth targets are to be established on the basis of achievement standards, not typical growth patterns or past achievement; and (c) the state must have a longitudinal pupil data system, capable of tracking individual pupils as they move among schools and LEAs within the state.

The requirements for growth models of AYP under this pilot are relatively restrictive. The models must be consistent with the ultimate goal of all pupils at a proficient or higher level by 2013-2014, a major goal of the statutory AYP provisions of NCLB. More significantly, they must incorporate comparable annual assessments, at least for each of grades 3-8 plus at least one senior high school year, and those assessments must be approved by ED and in place for at least one year before implementation of the growth model. Further, all performance expectations must be individualized, and the state must have an infrastructure of a statewide, longitudinal database for individual pupils. Proposed models would have to be structured around expectations and performance of individual pupils, not demographic groups of pupils in a school or LEA, although individual results would have to be aggregated for the demographic groups designated in NCLB.

According to ED, 20 states have submitted applications to be allowed to use growth models to make AYP determinations beginning with either the 2005-2006 or 2006-2007 school years. Two states, North Carolina and Tennessee, were approved to use proposed growth models in making AYP determinations on the basis of assessments administered in the 2005-2006 school year.[23] Thirteen additional states—Alaska, Arkansas, Arizona, Colorado, Delaware, Florida, Iowa, Michigan, Minnesota, Missouri, Ohio, Pennsylvania, and Texas—have been approved to participate in the pilot program subsequently. The growth models for individual states are briefly described below.

- Under Alaska's growth model, pupils will be included in the proficient group if their achievement level trajectory is on a growth path toward proficiency within three additional years for pupils in grades 4-9, or within two additional years for pupils in grade 10. (Alaska currently has no standards-based assessments for grades beyond 10.) Pupils in the 3rd grade (the earliest grade at which state assessments are administered) will be measured on the basis of status only, not

[22] See http://www.ed.gov/policy/elsec/guid/growthmodelguidance.pdf.

[23] One other state, Massachusetts, incorporates a partial growth element into its safe harbor provision. In that state, a school or LEA that fails to meet the standard AYP requirements still makes AYP if the number of pupils in relevant groups and subjects scoring below the proficient level declines by 10% or more from the previous year *or* declines sufficiently to put them on track toward proficiency by the end of the 2013-2014 school year.

growth. The growth model will not apply to pupils with disabilities who take alternate assessments.

- In Arizona, the growth model will be applicable to pupils in grades 4-8 only. Pupils will be included in the proficient group if their achievement level trajectory is on a growth path toward proficiency within three years or by 8th grade, whichever comes first. Pupils in the 3rd grade (the earliest grade at which state assessments are administered) will be measured on the basis of status only, not growth. Unlike some other states participating in the growth model pilot, pupils with disabilities who take the state's alternate assessment will be included in the Arizona growth model.
- Under the Arkansas policy, AYP will be calculated each year on the basis of both statutory provisions and using the state's growth model, and a school will meet AYP standards if it qualifies using either method. Under the growth model, pupils in grades 4-8 will be deemed to be proficient if they are on a growth path toward proficiency by the end of 8th grade. Pupils already proficient must be on a path to continue to be proficient through grade 8 (i.e., growth path criteria will be applied to all pupils, proficient and non-proficient).
- In Colorado, the growth model will be applicable to pupils in grades 4-10, but will not include pupils with disabilities who take alternate assessments. Pupils will be included in the proficient group if their achievement level trajectory is on a growth path toward proficiency within three years or grade 10 (if earlier); growth calculations will include currently proficient students only if they are on a trajectory to maintain proficiency over the next three years or grade 10. AYP will be calculated each year on the basis of both statutory provisions and using the state's growth model, and a school will meet AYP standards if it qualifies using either method.
- Under the Delaware growth model, AYP will be calculated each year on the basis of both the statutory provisions and using the state's growth model, and a school will meet AYP standards if it qualifies using either method. Individual pupil performance will be tracked from one year to the next. Specified numbers of points will be awarded on the basis of changes (if any) in pupils' performance level; points will be awarded for partial movement toward proficiency, but not for movement beyond proficiency. The average growth scores for schools and LEAs to meet AYP standards increase steadily until 2013-2014, by which time all pupils would be expected to achieve at a proficient or higher level.[24]
- Under the Florida model, AYP will be determined separately for each pupil subgroup in each school or LEA (i.e., not for schools or LEAs as a whole) using the statutory models plus a growth model, and the school or LEA will meet AYP standards if each pupil subgroup makes AYP using any of the three models. Florida's growth model will be essentially the same as the current status model except that proficient pupils will include both those currently scoring at a proficient or higher level and those who are on an individual path toward proficiency within three years. The model will be applied to AYP determinations for grades 3-10 (with some modifications for pupils in grade 3).

[24] Delaware's proposal included use of confidence intervals at an unspecified level in implementing the growth model; however, ED approved use of the model without confidence intervals.

- Under the Iowa model, pupil tests score ranges below proficient have been divided into three categories: Hi Marginal, Lo Marginal, and Weak. A student who rises from one of these levels to a higher level, and has not previously attained the higher level, will be deemed to have met "Adequate Yearly Growth" (AYG). For schools and LEAs that have not met AYP though application of the standard status and safe harbor models, students making AYG will be added to those scoring proficient or above, and this combined total will be used in determining whether the school or LEA makes AYP for the year. Students beginning at the Weak level must reach proficiency within three years, those beginning at Lo Marginal must become proficient within two years, and those beginning at Hi Marginal must reach proficiency within one year. By 2014, the growth model would no longer be used, and all pupils will be expected to achieve at a proficient or higher level.
- In Michigan, students have been deemed to be proficient if their achievement test scores are at a proficient or advanced level, or if the scores of individual students are within two standard errors of measurement (in effect, a 95% confidence interval) of the test score cut point for proficiency[25] (such students are considered to be "provisionally proficient"). The growth model adds a third category of students "on trajectory" toward proficiency. To determine whether students are on trajectory toward proficiency, each of the proficiency levels is divided into three sub-levels. Similar, but slightly different, procedures are applied to Michigan's MI-Access Functional Independence alternate assessment. The growth model does not cover high school students. If a student's performance improves over the previous year by a number of sub-levels such that, if the improvement continued at the same rate in the future, they would reach proficiency within three years, they are counted as being on trajectory toward proficiency. Thus, the total of students scoring at a proficient level plus non-proficient students on a trajectory toward proficiency within three years plus those who are provisionally proficient would be compared to the total number of students tested in each relevant subgroup.
- In Minnesota, both the statutory models of AYP and a growth model will be applied in all AYP determinations, and AYP will be made if either of these criteria are met. The Minnesota growth model incorporates a "value table" under which varying amounts of partial credit will be given for growth among sub-levels of achievement below proficient. The partial credit will be greater, the greater the student's achievement growth. The resulting calculations will converted to a scale consistent with the standard AMOs in reading and mathematics to determine if the AMOs have been met. Pupils at all grade levels will be included, as well as pupils with disabilities taking alternate assessments, as long as two consecutive years of assessment results in Minnesota are available for the pupils.
- In Missouri, if students currently scoring below a proficient level are on track to be proficient within either four years or by 8th grade, whichever occurs first, they will be added to the number of students currently scoring at a proficient or higher level. Students in grades 3 and 8 will be evaluated on the basis of the status model and "safe harbor" only. No confidence intervals will be applied to growth

[25] Most states use confidence intervals in their AYP determinations. However, in most cases, the confidence intervals are applied to group average percentages of students scoring proficient or above, not individual student scores.

model calculations. Only the current status and safe harbor models will used for AYP determinations for grades 9-12. Students with disabilities, including those taking the state's alternate assessment for students with the most severe cognitive disabilities, will be included in the growth model, applying trajectories and achievement levels associated with either the regular or alternate assessments.

- The North Carolina policy adds a projection component to the current group status model. If the achievement level of a non-proficient pupil is on a trajectory toward proficiency within four years, then the pupil is added to the proficient group. The trajectory calculations will be made for pupils in the 3rd through 8th grades.
- Ohio has adopted a variation of the "projection" or "on track to proficiency" approach that is common to the North Carolina, Tennessee, Arkansas, and Florida models. After application of the standard status and safe harbor models, if any pupil group fails to meet AYP, then a determination will be made if a sufficient proportion of pupils in the group is on track toward meeting the required proficiency threshold as of a "target grade." In the case of elementary and middle schools, the target grade will be either the grade level following the highest grade offered by the school (i.e., for a K-5 school, the 6th grade), or four grades beyond the pupil's current grade, whichever comes first. In the case of a high school, pupils would have to be on track toward proficiency by the 11th grade. Pupils currently scoring at a proficient level but who are projected to be below the proficient level by the target grade will not be considered to be proficient.
- Pennsylvania's growth model will be applied in cases where AYP is not met under the statutory models of AYP. The growth model will consider whether each pupil is projected to be proficient in one to three years (the time period varies by grade level). If a currently proficient pupil is projected to score below proficient, he or she will be considered non-proficient under the growth model.
- Under the Tennessee policy, schools and LEAs will have two options for meeting AYP: meeting either the AYP standards under the group status or successive group improvement models of current law, or meeting AYP standards according to a "projection model." Under the projection model, pupils are deemed to be at a proficient or higher level of achievement if their test scores are projected to be at a proficient or higher level three years into the future, on the basis of past achievement levels for individual pupils. Tennessee's projection model will not be applied to high schools.
- In Texas, a projection component is added to the current group status model. If the achievement level of a non-proficient pupil is projected to be at or above the proficient level by the next "high stakes grade" (5, 8, or 11), then the pupil is added to the proficient group. Projections will be based on current year scores for individual pupils in both reading *and* math plus mean scores in reading *or* math (depending on the subject for which the projection is being calculated) for the school they attend. This technique will be applied to pupils taking the general state assessment as well as the TAKS-M Alternate Assessment; pupils with more substantial cognitive disabilities who take the TAKS-Alt Alternate Assessment will be included in the growth model but using a different method based on their rate of improvement among sub-levels of achievement.

Overall, most of the growth models approved by ED thus far are based upon supplementing the number of pupils scoring at a proficient or higher level with those who are projected, or deemed

to be on a trajectory, to be at a proficient level within a limited number of years. Eleven of the fifteen approved models follow this general approach. Among these states, a distinction may be made between eight states (North Carolina, Arkansas, Florida, Alaska, Arizona, Missouri, Michigan, and Texas) that combine currently proficient pupils with those not proficient who are "on track" toward proficiency, and four states (Ohio, Pennsylvania, Tennessee, and Colorado) that consider only projected proficiency levels for all pupils (i.e., currently proficient pupils who are not on track to remain proficient are counted as not proficient) when the growth model is applied. In contrast, the models used by at least three other states—Delaware, Iowa, and Minnesota—focus on awarding credit for movement of pupils among achievement categories up to proficiency.

A 2009 evaluation report by ED focuses on the two states approved to use a growth model for AYP determinations in the 2005-2006 school year, North Carolina and Tennessee.[26] In these two states, use of the growth models had minimal impact on AYP determinations based on 2005-2006 test results—no schools in North Carolina and only seven schools in Tennessee made AYP through use of the growth model, but would not have made AYP through the methods explicitly authorized in the ESEA.

Issues Regarding Growth Model Alternatives to AYP Models in the NCLB Statute

Why is there increased interest in growth models for determining AYP under NCLB? What might be the major advantages and disadvantages of growth models of AYP, in comparison to status or improvement models? These questions are addressed in the following pages.

Are Growth Models of AYP More Fair and Accurate than Status or Improvement Models?

Many proponents of growth models for school/LEA AYP see them as being more fair—to both pupils and school staff—and accurate than status or improvement models, primarily because they can be designed to take into consideration the currently widely varying levels of achievement of different pupil groups. Growth models generally recognize the reality that different schools and pupils have very different starting points in their achievement levels and recognize progress being made at all levels (e.g., from below basic to basic, or from proficient to advanced), giving credit for all improvements over previous performance.

Growth models would likely increase the ability to attribute pupil achievement to their current school, as opposed to their past schools or background characteristics, especially (but not only) if controls (and/or predicted growth elements) are included in the model. They more directly measure the effect of schools on the specific pupils they serve over a period of years, attempting to track the movement of pupils between schools and LEAs, rather than applying a single standard to all pupils in each state. They have the ability to focus on the specific effectiveness of schools and teachers with pupils whom they have actually taught for multiple years, rather than the change in performance of pupil groups among whom there has usually been a substantial amount of mobility. They can directly (as well as indirectly) adjust for non-school influences on

[26] "Evaluation of the 2005-2006 Growth Model Pilot Program," January 15, 2009, U.S. Department of Education [available at http://www.ed.gov/admins/lead/account/growthmodel/index.html].

achievement, comparing the same students across years and reducing errors due to student mobility.

Proponents of growth models often argue that status models of AYP in particular make schools and LEAs accountable for factors over which they have little control, and that status models focus insufficiently on pupil achievement gains, especially if those gains are below the threshold for proficient performance, or gains from a proficient to an advanced level. Status models, such as the current primary model of AYP under NCLB, might even create an undesirable incentive for teachers and schools to focus their attention, at least in the short run, on pupils who are only marginally below a proficient level of achievement, in hopes of bringing them above that sole key threshold, rather than the most disadvantaged pupils whose achievement is well below the proficient level. The current status model of AYP also confers no credit for achievement increases above the proficient level, that is, bringing pupils from the proficient to the advanced level.

At the same time, growth models of AYP have the significant disadvantage of implicitly setting lower thresholds or expectations for some pupil groups and/or schools. Although any growth model deemed consistent with NCLB would likely need to incorporate that act's ultimate goal of all pupils at a proficient or higher level of achievement by 2013-2014 (see below), the majority of such models used currently or in the past do not include such goals, and tend to allow disadvantaged schools and pupils to remain at relatively low levels of achievement for considerable periods of time.

Growth models of AYP may be quite complicated, and may address the accountability purposes of NCLB less directly and clearly than status or (to a lesser extent) improvement models. If the primary purpose of AYP is to determine whether schools and LEAs are succeeding at raising the achievement of their current pupils to challenging levels, with those goals and expectations applied consistently to all pupil groups, then the current provisions of NCLB might more simply and directly meet that purpose than growth model alternatives.

Pupil mobility among schools and LEAs is substantial, and has important implications for all models of AYP. However, its implications are multifaceted, and do not necessarily favor a particular AYP model. Growth models have the advantage of attempting to track pupils through longitudinal data systems. But if they thereby attribute the achievement of highly mobile pupils among a variety of schools and LEAs, accountability is dispersed. At the same time, the presence of highly mobile pupils in the groups considered in determining AYP under status and improvement models may seem unfair to school staff. However, the impact of such pupils in school-level AYP determinations is limited by NCLB's provision that pupils who have attended a particular school for less than one year need not be considered in such determinations.

Are Growth Models of Greater Value than Status or Improvement Models for Purposes Other than Accountability?

Growth models of AYP may offer increased value for purposes *other than* meeting the school and LEA accountability requirements of NCLB. These other purposes may include diagnosing pupil needs, conducting educational research, or pinpointing the specific impact of teachers, schools, or other educational resources on pupil achievement. These advantages derive largely, but not solely, from the incorporation of longitudinal pupil tracking systems within growth models.

Of course, current law does not prevent the use of growth models, under state authority, as a diagnostic/research/alternative accountability tool separate from the AYP and other requirements of NCLB. While the current statutory text and policy guidance associated with NCLB discourage

the use of separate state and federal accountability systems for schools and LEAs,[27] they are not prohibited in practice, and separate accountability systems are currently being used by several states alongside the AYP system required by NCLB. Finally, the usefulness of a model of AYP for purposes *other than* accountability may be of limited relevance to a debate over whether such a model should be used for the accountability purposes of NCLB.

Do States Have Sufficient Resources to Develop and Implement Growth Models?

It is generally agreed that growth models of AYP are more demanding than status or improvement models in several respects, especially in terms of data requirements and analytical capacity. For a longitudinal data system sufficient to support a growth model, it is likely that states would need to have pupil data systems incorporating at least the following:

1. A unique statewide student identifier.
2. The ability to produce comparable results from grade to grade and from year to year (vertically-scaled assessments).
3. Student-level enrollment, demographic and program participation information.
4. Information on untested students.
5. Student level graduation and dropout data.
6. State-wide audit system.[28]

Although the availability of information on state data systems is insufficient to enable one to determine with precision how many states could or could not currently implement such models if they chose to do so, it is very likely that growth models generally require resources and data systems that many states currently lack.[29]

This concern is being addressed in part through an ED program intended to help states design, develop, and implement statewide, longitudinal data systems. An initial appropriation of $24.8 million was provided for this program, administered by ED's Institute of Education Sciences (IES),[30] for FY2005. Subsequently, $24.6 million was appropriated for each of FY2006 and FY2007, and $48.3 million for FY2008. Thus far, a total of 27 states have received awards through two rounds of competition.[31] In addition, $250 million was recently appropriated for this program for FY2009 under H.R. 1, the American Recovery and Reinvestment Act.

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[27] For example, NCLB provides that "Each [participating] State shall demonstrate that the State has developed and is implementing a single, statewide State accountability system...." Nevertheless, several states have continued to administer separate accountability systems, authorized under state law, while also implementing the AYP provisions of NCLB.

[28] Aimee Guidera, director of the Data Quality Campaign, as quoted in: Commission on No Child Left Behind, Commission Staff Research Report, "Growth Models: An examination within the context of NCLB," August 2006, available at http://www.aspeninstitute.org/sites/default/files/content/docs/commission%20on%20no%20child%20left%20behind/Growth_Models_and_NCLB_Report.pdf.

[29] According to a March 16, 2005, Memo from the Council of Chief State School Officers http://www.ccsso.org/content/pdfs/Growthmemo.pdf, about half of the states have "statewide individual student record data systems" necessary to implement growth models of AYP.

[30] This program is authorized by Section 208 of the Education Sciences Reform Act of 2002, P.L. 107-279. The authorized funding level is $80 million for FY2003 and "such sums as may be necessary" for each of the succeeding five fiscal years.

[31] For additional information, see http://nces.ed.gov/Programs/SLDS/.

Under this program, aid is to be provided to state educational agencies (SEAs) via cooperative agreements, not grants, to allow increased federal involvement in the supported activities. According to the announcement in the April 15, 2005 *Federal Register*, the program is intended "to enable SEAs to design, develop, and implement statewide, longitudinal data systems to efficiently and accurately manage, analyze, disaggregate, and use individual student data.... Applications from states with the most limited ability to collect, analyze, and report individual student achievement data will have a priority...." According to ED, the program is designed to help SEAs meet the AYP and reporting requirements of NCLB, as well as to conduct value-added or achievement growth research, including "meaningful longitudinal analyses of student academic growth within all subgroups specified by the No Child Left Behind Act of 2001." There will also be an emphasis on encouraging data sharing among states, while at the same time protecting the security and privacy of data.

Are Growth Models Consistent with NCLB's Ultimate Goal?

Most growth models used before initiation of ED's growth model pilot, or still used as part of state-specific accountability systems, have not incorporated an ultimate goal such as the one under NCLB—that all pupils reach a proficient or higher level of achievement by 2013-2014. Non-NCLB growth models have generally incorporated one of two types of growth target, the "how much improvement is enough" aspect of the model: (a) data driven/predicted growth, or (b) policy driven/required growth targets. The first type of growth target has been most common, while NCLB's ultimate goal would represent a growth target of the second variety, with separate paths (with presumably separate starting points) for each relevant pupil cohort. The models approved thus far under ED's growth model pilot arguably meet the ultimate goal requirement. However, under some of these models, pupils need only be proficient or *on track toward* proficiency within a limited number of years as of 2013-2014.

Would Use of Growth Models Likely Reduce the Number of Schools/LEAs Identified as Failing to Meet AYP?

With the initial implementation of the provisions of NCLB, several thousand public schools and hundreds of LEAs have been identified each year as failing to meet state AYP standards.[32] It frequently appears to be implicitly assumed by potentially interested parties that widespread use of growth models of AYP would result in significantly smaller percentages of schools and LEAs being identified as failing to meet AYP standards. This view seems to be based largely on the assumption that differing starting points for various cohorts of pupils would involve lower starting points and initial AMOs for disadvantaged pupil groups, reducing the number of schools or LEAs that fail to meet AYP due to the performance of one or a few of such demographic groups.

Indeed, it is easy to hypothesize that during the first few years of implementation of growth models of AYP, required performance thresholds would be relatively low for disadvantaged pupil cohorts, and fewer schools or LEAs would fail to meet AYP standards. However, if one assumes that any AYP model under NCLB must meet that act's ultimate goal requirement, with regular increases in AMOs leading toward the ultimate goal of all pupils at a proficient or higher level by 2013-2014, any significant reduction in the number of schools or LEAs failing to make AYP would likely be temporary. This is particularly true because we are already several years into

[32] See CRS Report RL32495, *Adequate Yearly Progress (AYP): Implementation of the No Child Left Behind Act*, by Wayne C. Riddle.

NCLB's presumed overall timeline of 2001-2002 (the "base year" for AYP determinations) to 2013-2014.

Of course, if it is assumed that use of growth models somehow improves the productivity of schools and LEAs—that is, by improving motivation of pupils or teachers, or by providing better diagnostic data on pupil achievement—then it is possible that this would ultimately reduce the number of schools/LEAs failing to meet AYP, but there is currently no direct proof that this would occur. As noted earlier, where estimates are available, the growth models approved for use under ED's pilot program appear to reduce the number of schools failing to meet AYP standards to a very limited degree.

Can Growth Models Be Applied at Grade Levels Without Annual Assessments?

The value and usefulness of growth models of AYP are highly dependent on a regular flow of valid information on pupil achievement levels. As a result, it is frequently assumed that growth models can be appropriately implemented only when achievement test results, linked to a continuum of state content and performance standards, are available at least annually. This creates difficulties for implementing growth models across the entire K-12 grade span, since NCLB requires the administration of state standards-based assessments in each of grades 3-8, plus only one senior high school grade. It may be possible to fully implement growth models only over grade ranges for which annual assessment results are available. Substantial difficulties might be presented by the large degree of variation in curriculum, and frequently in assessments, for senior high school pupils, although that can present difficulties under any of the three types of AYP model.

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